

## Amendment/Response

Reply to Office Action of July 13, 2007

**REMARKS/DISCUSSION OF ISSUES**

Claims 1-9 and 11-13 are pending in this application, with claims 1 and 8 being amended and claim 10 being cancelled. Claim 8 is amended to correct an error; "resistance" is measured in ohms, while "resistivity" is measured in ohm•meters.

**Rejections under 35 U.S.C. § 112**

Claim 1 is rejected under 35 U.S.C. § 112 as failing to comply with the written description requirement. The rejection is respectfully traversed. Applicant believes that one skilled in the art of conducting thin films would have known that the device as claimed would not contain a p-n or pin junction, and that stating such a fact in the specification would have been superfluous.

MPEP Section 2173.05(i) states, "Any claim containing a negative limitation which does not have basis in the original disclosure should be rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. **Note that a lack of literal basis in the specification for a negative limitation may not be sufficient to establish a prima facie case for lack of descriptive support.** *Ex parte Parks*, 30 USPQ2d 1234, 1236 (Bd. Pat. App. & Inter. 1993). See MPEP § 2163 - § 2163.07(b) for a discussion of the written description requirement of 35 U.S.C. 112, first paragraph." (Emphasis added).

The emphasized part refers to the burden of proof for the examiner. It states that just because the specification may lack a literal basis for the negative limitation, that doesn't mean that the examiner has established her burden of proof. That's what *Ex parte Parks* stands for. The section then goes on to say that the examiner should look at MPEP Sections 2163 through 2163.07(b) for the discussion of the written description requirement.

Applicant did so. And this is what Applicant found.

MPEP Section 2163 IIA3(a) states, "What is conventional or well known to one of ordinary skill in the art need not be disclosed in detail. *See Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d at 1384, 231 USPQ at 94. >See also *Capon v. Eshhar*, 418 F.3d 1349, 1357, 76 USPQ2d 1078, 1085 (Fed. Cir. 2005)('The 'written description' requirement must be

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applied in the context of the particular invention and the state of the knowledge.... As each field evolves, the balance also evolves between what is known and what is added by each inventive contribution." )< If a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met. See, e.g., *Vas-Cath*, 935 F.2d at 1563, 19 USPQ2d at 1116; *Martin v. Johnson*, 454 F.2d 746, 751, 172 USPQ 391, 395 (CCPA 1972) (stating "the description need not be in *ipsis verbis* [i.e., "in the same words"] to be sufficient")."

Let's now compare this to the facts of the case. One skilled in the relevant art, that is, the art of investigators into electrical properties of ultra thin films, would be familiar with p-n and pin junctions, because conducting thin films are of main interest for electronic devices. Therefore, the fact that the claimed device does not contain a p-n or pin junction would be well known to one of ordinary skill in the art, and thus need not be disclosed in detail. According to this analysis, the specification need not explicitly state that the device does not contain a p-n or pin junction because this is well known to one of ordinary skill in the art. As the MPEP section above says, "if a skilled artisan would have understood the inventor to be in possession of the claimed invention at the time of filing, even if every nuance of the claims is not explicitly described in the specification, then the adequate description requirement is met." Applicant believes and suggests that this is the case here.

Therefore, including this negative limitation in claim 1 is not a violation of the written description requirement. Reconsideration of the rejection of claim 1 under 35 U.S.C. § 112 is respectfully requested.

Note that claim 1 is amended to incorporate the limitation of claim 10, which is now cancelled. In particular, claim 1 now recites that the substrate material has metastable bonds on its surface immediately before deposition of the film.

Before proceeding with the arguments against the rejections, Applicant believes it would be useful to review metastable bonds. Metastable bonds are typically found on freshly prepared surfaces of materials with covalent bonds. For example, think of a diamond crystal. Break it in a high vacuum environment. The bonding between C-atoms on opposite sides of the break

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disconnect their bond. Each of these C-atoms has a "dangling" bond. This "dangling" bond is not stable, but will connect to another "dangling" bond of another C-atom close by, which also has a "dangling" bond because it lost a neighboring atom during the fracture of the diamond crystal. The connecting bonds have to be bent to connect. That makes this bond "metastable."

Now open the system in which the diamond was broken to the air. Remember that we started with a fracture process in a high vacuum environment. If oxygen atoms hit the fracture surface, they will bond with the C-atoms and get stuck.

The same thing happens in the present invention. The Ge-atoms like to form a diamond lattice with covalent (=directional) bonding electrons. If the evaporation of germanium is stopped, we have "dangling" bonds at the surface, which will bend and connect with another "dangling" bond of a neighboring Ge-atom to form a metastable bond. If a metal-atom from the evaporator hits this surface atom, it will break the metastable bond, and form a primary bond with the Ge-film. All metal-atoms hitting the surface will get stuck, and one forms initially essentially a monolayer of metallic atoms. This gives metallic conduction.

If we let oxygen atoms flow into the high vacuum system after Ge-evaporation, they form an oxide film with the germanium, and all metastable bonds disappear. If we then deposit metal atoms in this surface, the metal-atoms would not form primary bonds with the oxide surface. Instead, they would diffuse over the surface and connect with other incoming metal-atoms, forming metallic islands which may form primary bonds with the oxide. Even if the average thickness of the metal atoms is 5 nm, the islands would usually not connect, and the resistance would be very high.

**Rejections under 35 U.S.C. § 102(b)**

Claims 1-7 and 10 are rejected under 35 U.S.C. § 102(b) as anticipated by Hamada (US Patent Publication 2003/0000930). The rejection of the claims, as amended, is respectfully traversed.

For anticipation under 35 U.S.C. 102, the reference must teach every aspect of the claimed invention either explicitly or impliedly (MPEP 706.02 IV).

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Hamada always writes that the metal film can be deposited on the substrate by a vacuum evaporation or plating process (e.g. claim 6, page 2 paragraph [20], and page 2 paragraph [27]). No mention is made of a "high vacuum environment" as required by claim 1. Both processes, i.e., vacuum evaporation and plating, yield metal layers with proper properties for his device. There is not need for a high vacuum environment for Hamada's device, which is why none is disclosed or suggested.

The process in Hamada cannot result in metastable bonds on the substrate surface. For the plating process, the semiconducting substrate cannot be kept clean, and if any metastable bonds existed right after the evaporation on the substrate, they would bond to something (a contaminant) before plating started. Obviously the special growth mechanism required for the metal film on the semiconductor in the present invention is not required for the manufacturing of the mask. Hamada does not disclose a special approach to deposit a metal film on the semiconducting substrate so that no contaminants could compensate for possible (but not likely) metastable bonds. A typical researcher writing a report or paper in which a special approach would be used would mention it, usually by referring to an 'in situ' vacuum process. No such mention exists in Hamada.

In the standard process of making metal films 50 microns or thicker for light reflection, there is no need to go to the extra effort to deposit the semiconducting substrate in a high vacuum system or to make certain that metastable bonds exist on the surface of the semiconducting substrate to insure bonding between substrate and metal film.

**Argument 2**

Hamada discloses a laser device that contains a mask which consists of a semiconducting substrate 11, a metal film 12, and a second semiconducting substrate 12. The metal film has a pattern of holes, through which a laser beam shines on a plate below.

The examiner states that a current flows through this film. This is incorrect. No electric current flows through this plate. Only the optical properties of the materials are important in this

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application. It is required that the metal film reflects the laser light, and that the light which passes through the holes of the metal film can pass through the semiconducting film.

The wavelength of the CO<sub>2</sub> laser given in the patent is such that the laser beam which passes through the metal holes will also pass through the Ge-substrates. The transparency of Ge to CO<sub>2</sub> was one of the reasons why germanium was picked as substrate for the mask. Again, no consideration for electrical currents was or is needed.

It is therefore respectfully suggested that the rejection of Claim 1 under 35 U.S.C. § 102 (b) as being anticipated by Hamada is unfounded in light of the current amendments. Claims 2-7, being dependent upon and further limiting independent claim 1 should be allowable for that reason as well as for the additional limitations they contain. Reconsideration of the rejection of claims 1-7 under 35 U.S.C. § 102 (b) is therefore respectfully requested.

**Rejections under 35 U.S.C. § 103(a)**

Claims 8-13 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Hamada. The rejection is respectfully traversed.

Claim 10 is cancelled.

Claims 8-9 and claims 11-13, being dependent upon and further limiting independent claim 1 should be allowable for that reason as well as for the additional limitations they contain. Reconsideration of the rejection of claims 8-9 and claims 11-13 under 35 U.S.C. § 103(a) is therefore respectfully requested.

In view of the foregoing, Applicant respectfully requests that the Examiner withdraw the rejections of record, allow all the pending claims, and find the application in condition for allowance. If any points remain in issue that may be resolved through a personal or telephonic interview, the Examiner is respectfully requested to contact the undersigned at the telephone number indicated or by e-mail directed to [Chris@PatentingServices.com](mailto:Chris@PatentingServices.com).

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Respectfully submitted,

A handwritten signature in cursive script, reading "Chris Pastel", written in dark ink. The signature is fluid and stylized, with the first and last names being clearly legible.

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